

Review

■ INDUSTRYWEEK

June 4, 1990

What if you could automatically search through large amounts of data and discover previously unknown information, rules, and relationships? That describes IXL: The Discovery Machine. Not a query language, it doesn't require users to know what queries to ask. IXL forms the queries automatically and executes them. Users can guide IXL or let it decide what is important to discover.

■ COMPUTERWORLD

August 13, 1990

IXL differs from a query language such as SQL because it forms its own queries and executes them automatically. Users said the software automatically found valuable information they would have had difficulty discovering manually.

At the U.S. Army and Air Force exchange Service in Dallas, IXL is searching military personnel demographic data to find buying patterns. The Exchange is the main retailer for U.S. Military installations throughout the world, controlling about 17,000 stores and serving 2 to 3 million customers. For example, IXL studied the demographics of personnel stationed in West Germany and determined that they would spend much less than was predicted by a homegrown sales projection program. Consequently, the exchange was able to avoid wasting money constructing facilities that would go underutilized.

Previously, the exchange employed one person at a \$30,000 annual salary to analyze the demographics statistically. A single analysis required two to three weeks to complete manually, while IXL gets the job done in two to three hours.

■ INFO WORLD

February 11, 1991

DVT suggests the most appropriate form of graphic display and provides new three-dimensional relationships between three fields, as well as displaying the magnitude of the relationship using a 3-D box that gets larger as more intersections between the field values occur. In addition to 3-D boxes, a variety of histograms, bar charts, pie charts, box plots, and surface diagrams are produced by DVT. Users may specify fields to be analyzed by using a pick list. In addition, each axis of an image can be rotated, providing a different view of the same relationship.

what they say about . . .

■ **COMPUTERWORLD**
February 11, 1991

■ Electronic Engineering
TIMES
April 6, 1987

■ **WEEK**
January 28, 1991

■ **BYTE**
September 1990

Try graphing nonnumeric spreadsheet data such as "Utah," "Crystal B" or "medium-high," and you are likely to get an error message. Not so with DVT. The personal computer-based package can automatically turn even abstract concepts into two- or three-dimensional graphics. "Not only can you visualize nonnumerical items, but you can define concepts and give them weight," said Ronald Cook, research director at Eltron Research, Inc. in Aurora, Ill.

The Auto/Intelligence package allows users to generate a rule-based expert system without any programming or even direct building rules. Moreover, the software takes advantage of research on interviewing, allowing experts to develop examples and concepts as they go. Initially, the user is asked to specify the selections or choices. He or she is then led to assigning identifying traits to each. These traits, and their opposites, are drawn out by pinpointing differences between a limited set of selections. Then the traits or characteristics are extended to attributes which can hold values.

One type of graph unique to DVT is the "3-D box graph," in which 3-D shaded boxes are laid inside a wire-frame 3-D grid. This graph can show all of a company's ongoing projects. The grid's height could represent total cost, with grid depth representing duration and starting dates shown along the width of the grid. Inside the grid, the boxes could represent the projects and be color coded to indicate non-numeric information, such as departments responsible for the project or the complexity of the project.

James Brown, a beta tester and consultant to the oil industry in Houston, said this type of graphing can give users a quick, intuitive sense of the "shape" of their database. "As soon as this came out I was jumping up and down, because I was getting the sort of things that would take days of work and a lot of head scratching otherwise," said Brown.

Unlike a query language, which requires you to formulate and test a hypothesis, IXL forms its own queries and automatically tests for them. By combining artificial intelligence, statistics, and database capabilities, the program saves you from having to test numerous hypotheses when you're trying to pinpoint the reasons for problems like sporadic defects on an assembly line. The program has uses in any application involving large data sets.

IntelligenceWare products

■ **MISWeek.**
December 12, 1988

■ **THWEEK**
May 22, 1990

■ **INFO
WORLD**
January 1, 1990

The lightning flash clarity of Sherlock Holmes' solutions was built on the detective's painstaking efforts to find the pattern in seemingly unrelated, often subtle clues. Currently, a new software technology is playing detective for medical researchers, crime analysts, insurance underwriters, financial wizards and high-tech manufacturers, searching huge databases for unexpected relationships between data fields. Unlike a query-based system, IXL performs an "intelligent data analysis" which utilizes questions a researcher might not have thought to ask.

IXL consists of statistical routines that construct mathematical relationships from data, and a rule-induction mechanism that expresses those mathematical patterns in terms of if...then rules. "IXL helps you see patterns and relationships in your database that you might not see with a typical statistics program," said a U.S. Forest Service data analyst based in Redding, California.

The analyst uses IXL to help understand how the composition of different areas of a forest changes the way it is affected by fire. The hope is to avoid another 1987 scenario, when almost a million acres of California forest were destroyed by wildfire.

"A traditional statistics program makes you first decide what you want to see, then it will test that hypothesis," he said. "With IXL, you define what range of variables you want to explore, and it will help you see new patterns.

Users can define links between items using a keyword search, and can fire rules and also access database elements. The product provides what the company calls "dynamic hypertext" capabilities. Unlike standard hypertext systems, Intelligence/Compiler can link text or objects depending upon the context and state of the system when the link is activated, rather than moving only to a predefined text field. (Objects in Intelligence/Compiler may have rules or programs attached to them. In addition, the system supports object orientation with multiple inheritance).

A program that can search large amounts of data and discover previously unknown connections has helped several government agencies better analyze complex data. IXL - The Discovery Machine, analyzes data with a built-in statistics expert that continually forms and tests hypotheses about relationships in the data. The package then uses machine-learning algorithms to generate rules to explain the logic within the data. The Coast Guard uses IXL to help analyze the origin of oil spills in the United States.

IntelligenceWare is the first software vendor to fight underemployment - at least on the PC front. It has created software that takes advantage of a PC's idle time, running in the user's absence and building a database for later on-line queries. Computer users are being overwhelmed by masses of data. Why not use one to reduce the other? Why not take our excess processor power and apply it to making the reams of data we have understandable? That is precisely what IXL: The Machine Learning System does, examining PC databases in unused hours and building a knowledge base of rules for querying and understanding the database.

Some IntelligenceWare Users:

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AT&T BELL LABS
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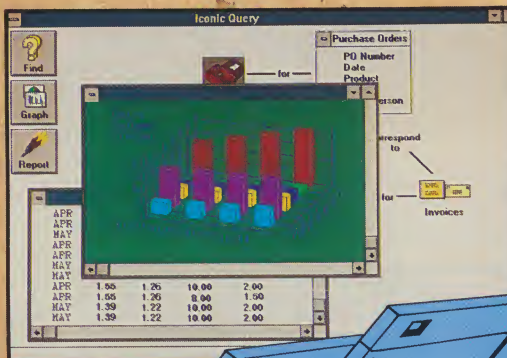
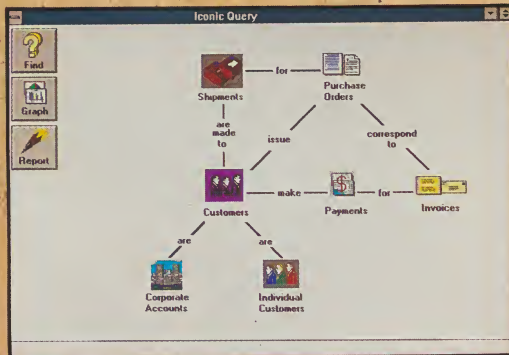
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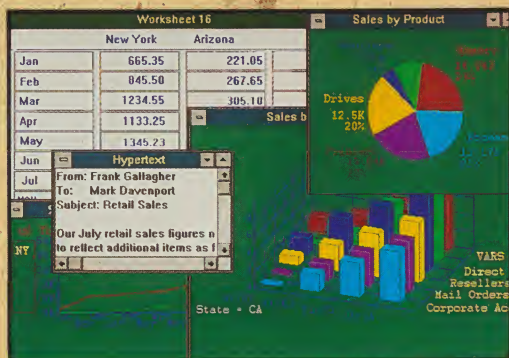
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The Information Discovery System

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DISCOVER UNEXPECTED PATTERNS, SIGNIFICANT TRENDS AND RULES.

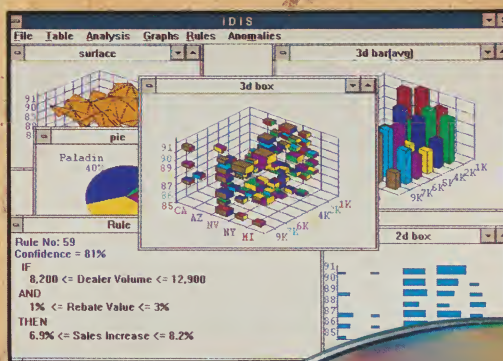
IDIS is the Information Discovery System that finds hidden treasures in your database. IDIS analyzes databases, automatically decides what to look at, discovers hidden patterns, rules of knowledge, interesting graphs and anomalies that are waiting to be uncovered!

You do not need to know a query language to use IDIS. Just specify your database name and say:

Go find something interesting and useful for me!

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- [1] IDIS examines your data with a set of built-in data analysis algorithms.
- [2] It forms hypotheses about what is relevant and tests them to generate rules and graphs.
- [3] It modifies the hypotheses and continues the cycle until important rules and patterns emerge.



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The *open architecture* of our products merges data from many commercial database systems such as Paradox™, ORACLE™, SYBASE™, DB2™, etc.

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